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ABSTRACT

This document discusses the relationships between organizational features of Individually Guided Education (IGE) as measured in the large sample survey of the IGE evaluation, and teacher job satisfaction. The theoretical model linking organizational features and teacher job satisfaction is tested using causal model analysis. Two findings were drawn from this analysis. First, teachers seem to gain satisfaction from a sense of participation in a larger movement, from having colleagues in other schools, and from sharing information with a broad audience. Second, teachers seem to gain satisfaction from a conviction that their educational program is an effective one. (Author)

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by Gary G. Price, Terence C. Janicki, Herbert C. Van Deventer, Jr., and Thomas A. Romberg

U.S. DEPARTMENT OF HEALTH
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Report from the Project on
Evaluation of Practices in Individualized Schooling

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- conducting and synthesizing research to clarify the processes of school-age children's learning and development
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- providing assistance to educators which helps transfer the outcomes of research and development to improved practice in local schools and teacher education institutions

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Abstract

This document discusses the relationships between organizational features of IGE, measured in the large sample survey phase of the IGE evaluation, and teacher job satisfaction. The theoretical model linking organizational features and teacher job satisfaction is tested using causal model analysis. Two findings were drawn from this analysis. First, teachers seem to gain satisfaction from a sense of participation in a larger movement, of having colleagues in other schools, and of sharing information with that broad audience. Second, teachers seem to gain satisfaction from a conviction that their educational program is an effective one.

This document is based on the large sample survey phase of the evaluation of Individually Guided Education (IGE). The sample included 155 schools. The document discusses the relationships between organizational features of IGE and teacher job satisfaction. The case or unit of analysis in this report is the school as a whole--not the individual teacher. A theoretical model linking organizational features and school-wide teacher job satisfaction is tested using causal model analysis.

The purpose of this phase, as with the other IGE evaluation phases, is to gain a comprehensive view of the IGE system's operation and effectiveness. The basic objective of the IGE evaluation is to identify features of IGE schooling that contribute to the success of instruction, especially in reading and mathematics (see Price, Janicki, VanDeventer, & Romberg, 1980a, 1980b). However, the study also seeks to identify features of IGE schooling that contribute to teacher job satisfaction. The identification of such features is critical to evaluating IGE as an educational system; it is also integral to understanding schooling in general.

One feature, the implementation of IGE components, was given particular scrutiny. Various IGE components would presumably affect the job satisfaction of teachers. Teacher job satisfaction is, without question, influenced by multiple, simultaneous causes that resist easy description. Therefore, the analysis used here examines relationships among a network of variables believed to influence teacher job

satisfaction--and thereby advances our understanding of each IGE feature and the network as a whole.

Teacher Job Satisfaction (JOBSAT) is a school-wide measure of teachers' satisfaction with a variety of aspects concerning their school and their profession. The measure is based on a questionnaire, the Job Satisfaction Survey, which contains 50 items. The items are listed in Appendix A. An overall job satisfaction score for each teacher was calculated by adding the number of times the teacher answered items with "satisfied," "quite satisfied," or "very satisfied." The aggregated job satisfaction score for each school was calculated by taking the mean of teachers' individual scores. More detail about the Job Satisfaction variable can be found in Technical Report 484 (Price, Janicki, Howard, Stewart, Buchanan, & Romberg, 1978).

This study does not directly compare IGE schools and non-IGE schools. Rather, it assesses certain fundamental and empirically testable premises on which IGE is based. One of these premises is that organizational features of IGE make it more likely that the staff will be satisfied with their jobs.

The study evaluates this premise by assessing relationships implied by the premise. This approach would not be feasible if the 155 IGE schools in the study had uniformly implemented the organizational features suggested by experts in IGE. Such uniformity, however, does not exist. The variability with which different schools implemented these

features is apparent in the distributions of variables (see Price et al., 1978a, 1978b, 1978c, 1978d, 1978e, 1978f, 1978g, 1980). The field study phase of the IGE evaluation provides corroborating evidence of such variability. Marked variability was found even among schools reputed to be exemplary IGE schools.

For the purpose of the causal model analysis, the premise that teacher job satisfaction is affected by particular organizational features of IGE has been represented as a network of postulated causal links among the variables. Figure 1 presents the various causal links in diagram form. It shows the paths of influence assumed a priori to underlie the relationships between teacher job satisfaction and the other variables. Definitions of the variables shown in Figure 1 and explanations of the procedures used to scale those variables are given in Technical Reports 476 to 480 and 483 (Price, et al., 1978a, 1978b, 1978c, 1978d, 1978e, 1978g). Figure 1, referred to as a structural diagram, path diagram, or causal model, follows certain graphic conventions. According to those conventions, a straight, unidirectional arrow signifies that the variable at its base directly influences the variable at its tip, and the omission of an arrow constitutes an explicit theoretical statement that no direct causal relationship exists. A variable is an indirect cause of a dependent variable if a path through two or more arrows can be traced from the dependent variable back to the first variable. Associated with each straight arrow is a nonzero

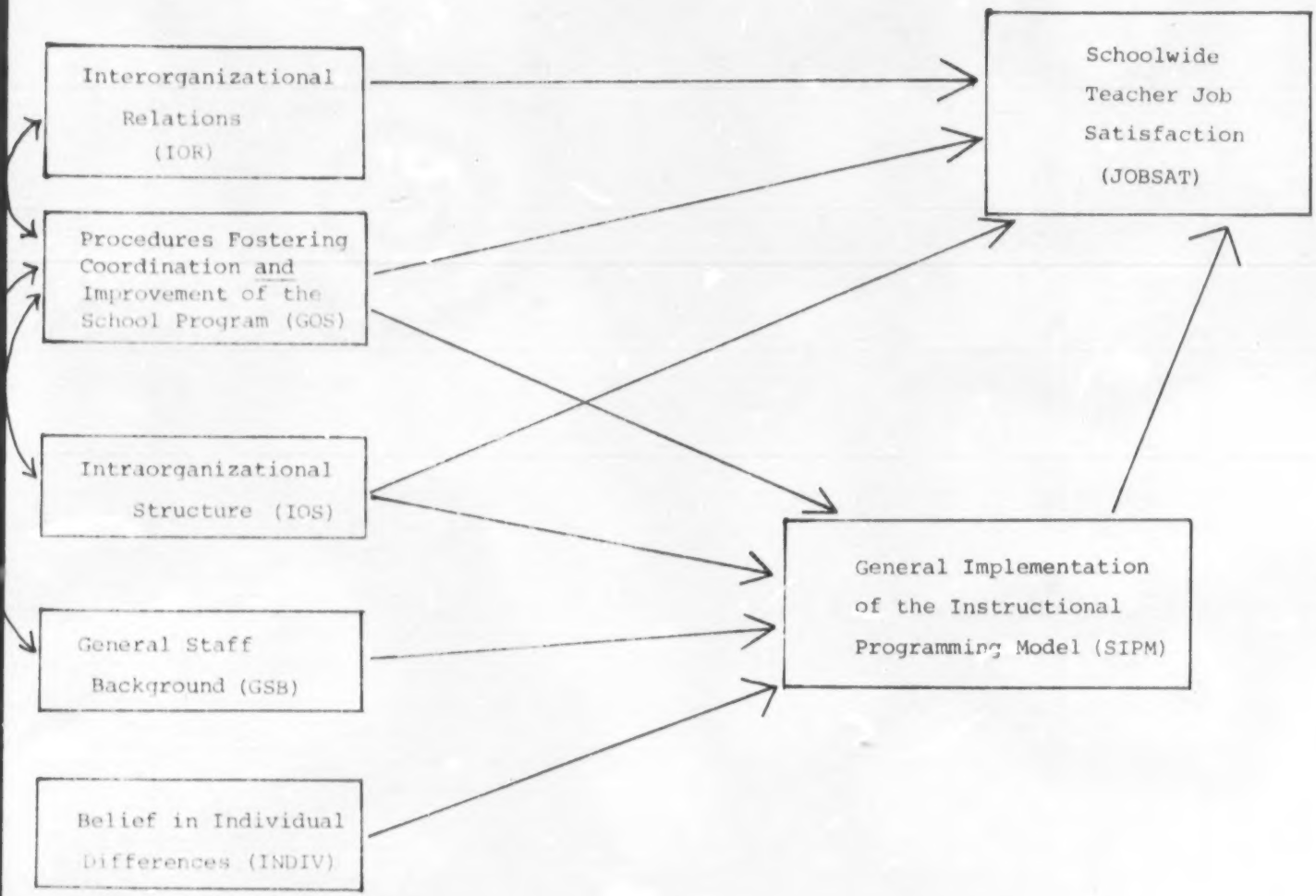
Interorganizational Relations (IOR)
Procedures Fostering Coordination and Improvement of the School Program (GOS)
Intraorganizational Structure (IOS)
General Staff Background (GSB)
Belief in Individual Differences (INDIV)
General Implementation of the Instructional Programming Model (SIPM)
Schoolwide Teacher Job Satisfaction (JOBSAT)

Figure 1. Phase I structural model predicting teacher job satisfaction.

value. The sign of the value denotes whether an increase in the causal variable produces an increase (plus) or a decrease (minus) in the dependent variable. A curved, bidirectional arrow is used at the left of the figure between variables which are known to be correlated, but for reasons not covered in the scope of the model.

Four variables, Interorganizational Relations (IOR), Procedures Fostering Coordination and Improvement of the School Program (GOS), Intraorganizational Structure (IOS), and General Implementation of the Instructional Programming Model (SIPM), are hypothesized to relate to teacher job satisfaction. The model in Figure 1 suggests that the amount of communication with other IGE schools (IOR) should help teachers feel better about their skills and be more satisfied with teaching. The structural model also suggests that schools with a well-functioning IGE program (schools high on GOS, IOS, and SIPM) would have satisfied teachers. The model indicates that General Staff Background (GSB) and Belief in Individual Differences (INDIV) indirectly affect teacher job satisfaction by way of SIPM. Factors affecting SIPM are discussed more completely in Technical Reports 510 and 511 (Price et al., 1980a, 1980b).

Corresponding to the structural model is a system of structural equations. These equations may be statistically examined for their agreement with the data collected in the large sample study. Within the limits imposed by the group-administered standardized tests and

previously developed questionnaires used to collect data, this approach provides a test of a theoretical model underlying IGE. If the relations between variables are inconsistent with Figure 1, probable inaccuracies in the underlying IGE model will be revealed. On the positive side, this approach can indicate important features and processes which deserve more attention from schools implementing IGE.

Analysis and Results

A Priori Model

The analysis began with an estimation of the a priori model. The initial estimation procedure was a straightforward application of multiple regression. The correlation matrix of variables used in the regression analysis is given in Table 1. Means and standard deviations of these variables are given in Table 2. Each endogenous variable was regressed on its theorized causes. Endogenous variables, i.e., variables under the influence of other variables in the model, have at least one straight arrow pointing toward them in a causal diagram. Exogenous variables are not under the influence of other variables in the model. Figure 2 shows the estimated model for teacher job satisfaction.

Adjacent to each path in Figure 2 is a path coefficient, which is a standardized multiple regression coefficient. Ordinarily these coefficients would be subjected to a statistical test, and hypothesized links

Table 1

Correlation Matrix for Teacher Job Satisfaction Analysis

	JOBSAT	SIPM	IOR	GOS	IOS	GSB	INDIV
JOBSAT	1.00000	.41421	.45554	.49912	.18243	.04655	.32409
SIPM	.41421	1.00000	.60854	.72897	.49570	.26864	.45289
IOR	.45554	.60854	1.00000	.72345	.46323	.23079	.43155
GOS	.49912	.72897	.72345	1.00000	.56988	.24814	.47223
IOS	.18243	.49570	.46323	.56988	1.00000	.27759	.20199
GSB	.04655	.26864	.23079	.24814	.27759	1.00000	.16266
INDIV	.32409	.45289	.43155	.47223	.20199	.16266	1.00000

Table 2

Means and Standard Deviations of Variables Used in the Analysis of Teacher Job Satisfaction

	Mean	Standard Deviation
JOBSAT	40.57	5.08
SIPM	62.44	12.26
IOR	20.49	6.81
GOS	58.18	9.91
IOS	20.52	3.80
GSB	3.84	.62
INDIV	3.16	.18

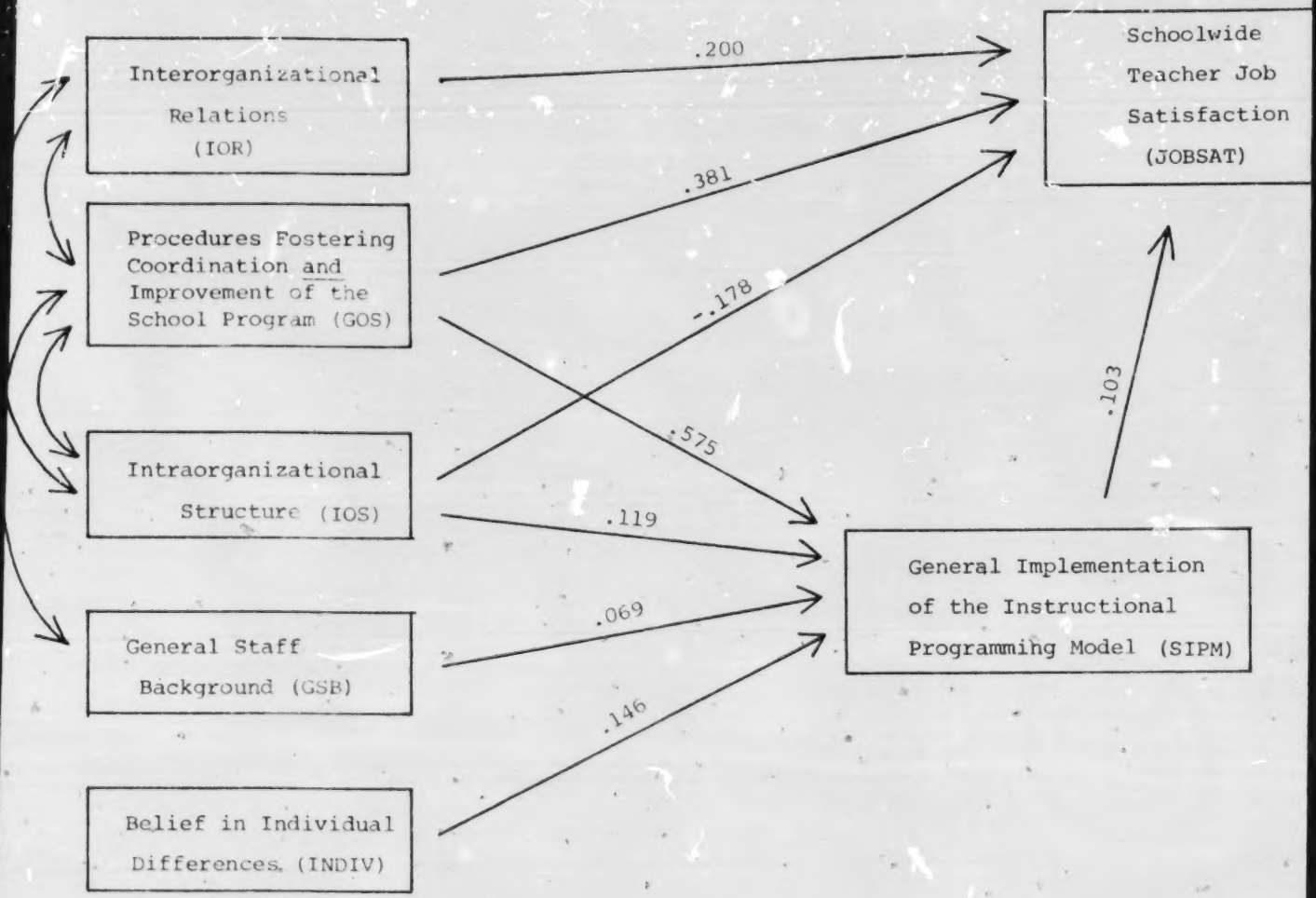

Figure 2. IGE evaluation, Phase I.

whose path coefficients did not differ statistically from zero would be dropped from the model. In effect, such a procedure tests whether a variable used as a predictor accounts for any unique variance in the dependent variable. However, when predictors are interrelated, interpretation of the tests for particular path coefficients can easily be misleading (see Goldberger, 1964; Gordon, 1968). As Table 1 makes evident, the predictors in this study were interrelated; therefore, the substantive interpretation of individual path coefficients becomes ambiguous. For this reason we are being deliberately wary about discussing individual regression coefficients. Accordingly, we have evaluated the variables hypothesized to be causes as a set rather than as individual predictors.

As a set of predictors, organizational features in the a priori model account for 29.1% of the variance in teacher job satisfaction which is statistically significant ($p < .001$).

For studies of this kind, 29.1% of the variance is good prediction. Whether one should regard good empirical prediction like this as practically significant depends on the interpretation given to the empirical relations, however strong they are. By adding to the prediction equation exogenous variables that had not been included a priori as predictors of teacher job satisfaction, the multiple R^2 is .301, which is only a 1% increase in variance explained. That small increase is not statistically significant ($p < .25$). Since the a priori model is approximately as predictive as is the fuller model, we are inclined to judge the a priori model to be adequate.

However, the negative coefficient of IOS does give some pause; the a priori model would have that coefficient be positive. The zero-order correlation of IOS with JOBSAT is, in fact, positive. It is .18 ($p < .05$, one-tailed test). The negative coefficient is consistent with an interpretation that contradicts the interpretation implicit in the a priori model. The contradictory interpretation is that the features measured by IOS have a weakly negative effect on JOBSAT, which is not apparent by examination of zero-order correlations because of the countervailing influence of IOR, GOS, and SIPM, with which IOS is positively correlated. However, neither the a priori interpretation nor the contradictory interpretation are unequivocally supported by these results. As noted above, the intercorrelation of predictors makes any interpretation of particular coefficients treacherous.

A different approach to handling the problem of interrelated variables is to create new unrelated variables that are linear combinations of the initial set of predictors. This principal components approach can be useful if the variables (factors) created can be defined in a substantively meaningful way. The approach proved useful in this study.

Variables causally prior to JOBSAT in the model were transformed through principle components factor analysis into a set of uncorrelated (orthogonal) factors. Varimax rotation was used on the full set of principle components. The net effect of performing these transformations was to impose orthogonality on the set of six predictors while

preserving as closely as possible a one-to-one correspondence between variables and principle components. In other words, each of the six factors is a good proxy for one of the variables and only slightly related to the other five variables. Correlations between the six orthogonal factors and the six untransformed variables are given in Table 3; these correlations are also known as factor loadings.

The uncorrelated, substantively interpretable factors defined in Table 3 were then used as predictors of JOBSAT. By having predictors that are uncorrelated among themselves, path coefficients can be compared and tested without ambiguity--as long as the variables used as predictors are themselves substantively meaningful. Factors corresponding to three organizational features had correlations with JOBSAT that were statistically significant and of noteworthy magnitude. The factor corresponding to GOS had a correlation of .32 ($p < .0001$ one-tailed test) with JOBSAT. The factor corresponding to IOR had a correlation of .31 ($p < .0001$, one-tailed test), and the factor corresponding to SIPM had .24 ($p < .01$, one-tailed test). The zero-order correlation coefficients reported here are equivalent to the standardized regression coefficients of JOBSAT regressed on GOS, IOR, and SIPM ($R^2 = .261$). That equivalence is inherent to perfectly uncorrelated predictors. The zero-order correlation of another organizational variable, IOS, is .02, which is statistically nonsignificant and trivially small.

Besides the four organizational features discussed in the preceding paragraph, two measures of the school staff, INDIV and GSB, were treated

Table 3

Factor Loadings of Varimax-Related Principle Components

	Factors					
Variables	GOSFAC	IORFAC	IPMFAC	INDIVFAC	IOSFAC	GSBFAC
GOS	.76	.38	.36	.23	.29	.10
IOR	.24	.89	.25	.20	.20	.09
IPM	.25	.26	.87	.22	.23	.12
INDIV	.14	.17	.17	.96	.06	.06
IOS	.06	.18	.19	.06	.94	.13
GSB	.06	.08	.09	.06	.11	.98
Eigenvalue of factor	.72	1.07	1.02	1.07	1.08	1.01

as causally prior to JOBSAT. The zero-order correlation of INDIV with JOBSAT is .20, which is statistically significant ($p < .01$, one-tailed test). The zero-order correlation of GSB with JOBSAT, on the other hand, is -.03, which is trivially small and statistically nonsignificant. The addition of INDIV to the predictor set of GOS, IOR, and SIPM improved the prediction JOBSAT from $R^2 = .261$ to $R^2 = .299$, a statistically significant increase. The unstandardized regression coefficients of these equations have not been given. They have no ready substantive interpretation since the factors are in standardized scale form. The interested reader can obtain them by multiplying the zero-order correlation and the standard deviation of JOBSAT, which is given in Table 2.

Interpretation

This analytical technique has yielded results that suggest a need for change in the a priori causal model. For example, in the a priori model IOS was hypothesized to influence JOBSAT positively. The negative path coefficient which appears in Figure 2 is not entirely inconsistent with the hypothesis, but it is certainly not supporting evidence. The analytical technique based on orthogonalized predictors also suggests that IOS measures organizational features which, at least among IGE schools, have little bearing on teachers' overall satisfaction with their job.

INDIV, the teachers' belief in the instructional relevance of individual differences, must also be reconsidered. There was no a priori hypothesis that beliefs of this kind would be related to JOBSAT in IGE schools. The analysis using orthogonalized predictors indicates there is a positive relation. A plausible interpretation of the relation is that teachers who believe strongly that good pedogogy takes individual differences into account feel a greater sense of efficacy in an IGE program than those who do not.

The analysis based on orthogonalized predictors supports some parts of the a priori model. The orthogonal proxies for IOR, GOS, and SIPM all have positive relations with JOBSAT. That finding certainly supports the a priori claims that teacher job satisfaction in IGE schools is positively influenced by: (a) relations with other IGE schools; (b) implementation of IGE-endorsed procedures for fostering the coordination and improvement of the school program; and (c) general implementation of the Instructional Programming Model.

Taking all of the findings into account, it appears that teacher job satisfaction in IGE schools is grounded in conceptually distinct but empirically related aspects of IGE. First, teachers seem to gain satisfaction from a sense of participating in a larger movement, of having colleagues in other schools, and of sharing information with that broader audience. Second, teachers seem to gain satisfaction from a conviction that their educational program is an effective one. Con-

trary to the expectations of the evaluation team, the contact with other teachers in the I & R unit is less salient as a source of job satisfaction. These interpretations have been corroborated by specific items in the JOBSAT questionnaire, but that item-by-item analysis is not included in this document.

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Appendix A

Job Satisfaction Survey

Job Satisfaction Survey

Directions: Please indicate your feelings of satisfaction with your job situation. For each item answer by indicating the phrase which most accurately describes your feelings. Use the code below and rows 1-50 of answer sheet B. Note: principals should omit the first ten questions.

(0) = Not satisfied
(1) = Somewhat satisfied
(2) = Satisfied
(3) = Quite satisfied
(4) = Very satisfied

How satisfied are you with:

1 the professional competence and leadership of your building administrators?

2 the ability of your building administrators to encourage people to work together?

3 the manner in which school policies and regulations are enforced?

4 the recognition you receive from your building administrators for your teaching achievements?

5 the procedures used to evaluate teachers in your school?

6 the fairness of the building administration in the assigning of extra duties?

7 the opportunities provided to discuss problems with building administrative personnel?

8 the trust you have in your building administrators?

9 the administrators' trust in you?

10 the innovativeness of your building administrators?

11 the personal and social relationships you have with other teachers?

12 the recognition you get from other teachers for your work?

13 the quality of work of other teachers in your school?

14 the amount of work done by other teachers in your school?

15 teaching, in light of what you expected to be doing as a teacher?

16 your future in your school district?

17 your opportunities for growth in your profession?

18 your school as an organization to work for?

19 the professionalism your school district shows toward teachers?

20 the degree of your involvement in your school?

21 the general reputation of your school?

22 the opportunities that you have to influence school policy?

23 your awareness of what is "going on" in your school?

24 the goals emphasized by your school?

25 the amount of money you make?

26 the salary schedule and fringe benefits in your school district?

27 the physical facilities of your school?

28 the number of students accommodated in your school?

29 the availability of appropriate instructional materials and equipment?

30 the arrangement of space and equipment in your school?

31 the amount of preparation time provided for teachers in your school?

32 the custodial services provided in your school?

33 the quality of the work you do?

34 the extent to which you are motivated by your job?

35 the freedom that you have to experiment with instructional methods?

36 the intellectual stimulation that you receive from your work?

37 the opportunities that you have to teach in your major areas of interest?

38 the amount of work you are expected to do?

39 the amount of time that you actually spend in teaching?

40 the total time that you spend with students?

41 the number of students for whom you are responsible?

42 the extent to which you are able to meet your students' academic needs?

43 the extent to which you are able to meet your students' affective needs?

44 the quality of your interactions with your students?

45 the extent to which the community recognizes and appreciates its educators?

46 the adequacy of financial support provided your school by the community?

47 the understanding of your school's program by parents and the community?

48 the community's involvement in your school's program?

49 the methods used to communicate with the community about your school?

50 the methods used to report student progress to parents?

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